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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,009	10/10/2001	Eisaku Ito	214806US3	4757

22850 7590 06/27/2003

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EXAMINER

KERSHTEYN, IGOR

ART UNIT PAPER NUMBER

3745

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,009

Applicant(s)

ITO ET AL.

Examiner

Igor Kershteyn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (4,626,174).

In figures 1, 2, 5, and 10-14, Sato et al. teach a blade 10, of a gas turbine, having a wide turning angle (as derived from inlet and outlet angle values), said blade having a belly side 10b, a back side 10a, a front edge (not numbered), and a rear edge (not numbered), wherein diameter of circles inscribing the belly side and the back side of adjacent blades decrease gradually from the front edge to the rear edge.

Note. Even though Sato et al. does not show inscribed circles, but rather shows radiuses S1 and S2, the concept of determining the distance between the blades is considered indifferent from Applicants'.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by De Freudenreich et al. (1,749,528).

In figures 1-4, Freudenreich et al. teach a blade 12, of a gas turbine, having a wide turning angle (as appears on the drawings), said blade having a belly side (not numbered), a back side (not numbered), a front edge (not numbered), and a rear edge

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(not numbered), wherein diameter of circles 0-8 inscribing the belly side and the back side of adjacent blades decrease gradually from the front edge to the rear edge.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (4,626,174) as applied to claim 1 above, and further in view of obvious design choice.

Sato et al. discloses the turning angle being 115 or more (See rejection of claim 1 over Sato et al.)

Sato et al. does not disclose expressly a ratio of blade maximum wall thickness and blade chordal length is 0.15 or more, and a wedge angle of the rear edge is 10 degrees or less.

Since applicant has not disclosed that having a ratio of blade maximum wall thickness and blade chordal length is 0.15 or more, and a wedge angle of the rear edge is 10 degrees or less solves any stated problem or is for any particular purpose above the fact that the blade profile reduces the flow velocity differential across the blade and it appears that the blade of Sato et al. would perform equally well with a shape and having the dimensions as claimed by applicant, it would have been an obvious matter of design choice to modify blade

of Sato et al. by utilizing a ratio of blade maximum wall thickness and blade chordal length is 0.15 or more, and a wedge angle of the rear edge is 10 degrees or less as claimed for the purpose of reducing the flow velocity differential across the blade.

Therefore, it would have been an obvious matter of design choice to modify the turbine of Sato et al. to obtain the invention as specified in claim 2.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (4,626,174) as applied to claim 1 above, in view of Shizuya et al.(4,786,233)., and further in a view of obvious design choice.

Sato et al. teach all the claimed subject matter except that he doesn't teach the blade.

Shizuya et al. in figures 1 and 2, teach a turbine blade 2 being a cooling blade of which cooling passage 15 is near the rear edge 14.

Since Sato et al. and Shizuya et al. are analogous art because they are from the same field of endeavor, that is the turbine blade art, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the turbine blade of Sato et al. with the cooling passage at the rear edge as taught by Shizuya et al. for the purpose of reducing thermal expansion and stress in the turbine blade.

Sato et al. as modified by Shizuya et al. does not disclose expressly the ratio of wall thickness of rear edge and throat between adjacent blades is 0.15 or less.

Since applicant has not disclosed that having the ratio of wall thickness of rear edge and throat between adjacent blades is 0.15 or less solves any stated problem or is for any particular purpose above the fact that the blade profile reduces the flow velocity differential across the blade and it appears that the blade of Sato et al. as modified by Shizuya et al. would perform equally well with the ratio of wall thickness of rear edge and throat between adjacent blades is 0.15 or less as claimed by applicant, it would have been an obvious matter of design choice to modify the blade of Sato et al. as modified by Shizuya et al. by utilizing the specific shape and dimensions as claimed for the purpose of reducing the flow velocity differential across the blade.

Therefore, it would have been an obvious matter of design choice to modify the turbine blade of Sato et al. as modified by Shizuya et al. to obtain the invention as specified in claim 3.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (4,626,174) as applied to claim 1 above, in view of Shizuya et al.(4,786,233)., and further in a view of obvious design choice.

Sato et al. teach all the claimed subject matter except that he doesn't teach the blade.

Shizuya et al. in figures 1 and 2, teach a turbine blade 2 being a cooling blade of which cooling passage 15 is near the rear edge 14.

Since Sato et al. and Shizuya et al. are analogous art because they are from the same field of endeavor, that is the turbine blade art, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the turbine blade of Sato et al. with the cooling passage at the rear edge as taught by Shizuya et al. for the purpose of reducing thermal expansion and stress in the turbine blade.

Sato et al. as modified by Shizuya et al. does not disclose expressly the ratio of the distance from the cooling passage to the rear edge and the wall thickness of rear edge of the blade is 2 or less.

Since applicant has not disclosed that having the ratio of the distance from the cooling passage to the rear edge and the wall thickness of rear edge of the blade is 2 or less solves any stated problem or is for any particular purpose above the fact that the blade profile reduces the flow velocity differential across the blade and it appears that the blade of Sato et al. as modified by Shizuya et al. would perform equally well with the ratio of the distance from the cooling passage to the rear edge and the wall thickness of rear edge of the blade is 2 or less as claimed by applicant, it would have been an obvious matter of design choice to modify the blade of Sato et al. as modified by Shizuya et al. by utilizing the specific shape and dimensions as claimed for the purpose of reducing the flow velocity differential across the blade.

Therefore, it would have been an obvious matter of design choice to modify the turbine blade of Sato et al. as modified by Shizuya et al. to obtain the invention as specified in claim 4.

Prior Art

Prior art made of record but not relied upon is considered pertinent to Applicant's disclosure and consist of three patents.

Noriyoshi (3,140,042) is cited to show a pair of adjacent blades having a wide turning angle and a diameter of circles inscribed between the blades decreasing from the leading edge to the trailing edge but fails to teach turbine blades.

Kronogard (3,192,719) is cited to show a pair of adjacent blades having a diameter of circles inscribed between the blades decreasing from the leading edge to the trailing edge but fails to teach turbine blades

Masai et al. (4,165,950) is cited to show a pair of adjacent blades having a wide turning angle and a diameter of circles inscribed between the blades decreasing from the leading edge to the trailing edge but fails to teach turbine blades.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Kershteyn whose telephone number is (703) 308 8317. The examiner can be reached on Monday-Friday from 8:00 a.m. to 4:30 p.m.

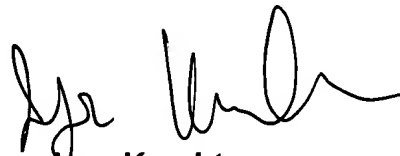
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached on (703) 308 1044. The fax number is (703) 305 3588.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308 0861.

IK

June 24, 2003



Igor Kershteyn
Patent examiner.
Art Unit 3745



EDWARD K. LOOK
SUPERVISORY PATENT EXAMINER
GROUP 3700
6/25/03